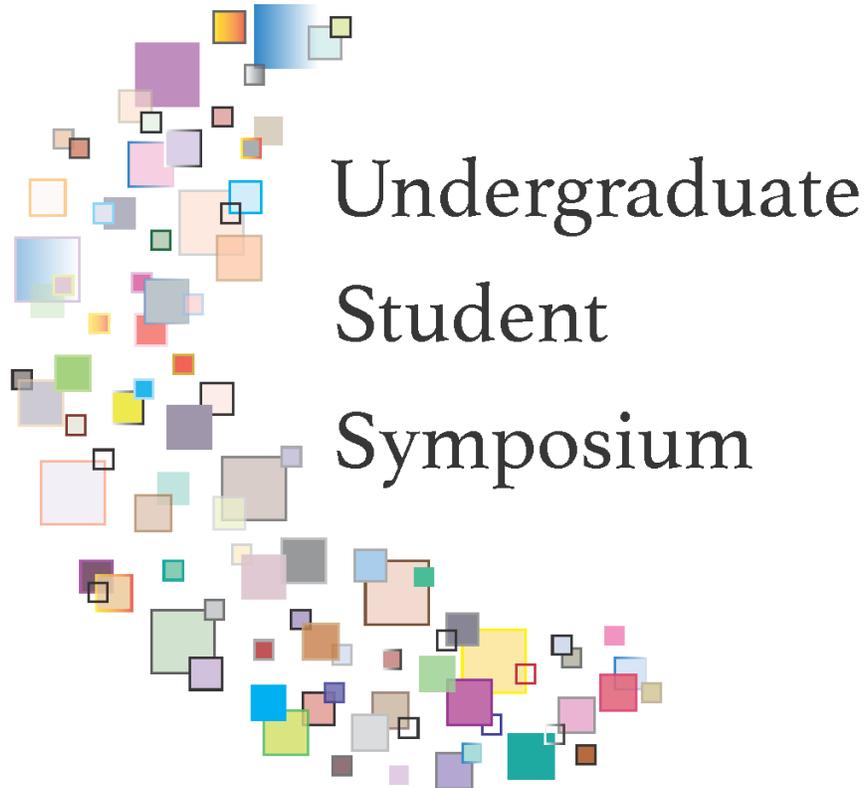


18th Annual
Undergraduate Student
Symposium



Friday, April 5, 2019

Alvin Sherman Library, Research, and Information Technology Center

NSU

Florida

Farquhar Honors College
**NOVA SOUTHEASTERN
UNIVERSITY**

Undergraduate Student Symposium 2019

The Undergraduate Student Symposium, sponsored by the Farquhar Honors College, presents student projects through presentations, papers, films, and poster displays. The event serves as a “showcase” demonstrating the outstanding scholarship of undergraduate students at NSU. The symposium is open to undergraduate students from all disciplines. Projects cover areas of student scholarship ranging from the experimental and the applied to the computational, theoretical, artistic, and literary. They are taken from class assignments and independent projects. Project presentations can represent any stage in a concept’s evolution, from proposal and literature review to fully completed and realized scholarly work. As in past symposia, the definition of scholarship will be sufficiently broad to include work presented in the biological and physical sciences, the social and behavioral sciences, computer science and engineering, mathematics, arts and humanities, nursing and health care, education, and business. This is the eighteenth annual Undergraduate Student Symposium.

USS 2019 Keynote Speaker



Harry K. Moon, M.D. is Executive Vice President and Chief Operating Officer of Nova Southeastern. He is responsible for the leadership, overall direction and effective management of NSU's administrative operations with particular emphasis on a more efficient and student-centered clinical operations. Dr. Moon will lead the development of operational and business partnerships to support NSU Health, the Academical Village and all NSU Colleges.

For the past 25 years, Dr. Moon has been working diligently to improve the medical, research and educational programs in South Florida. Among his many titles and accomplishments are his appointment as CEO of Cleveland Clinic Florida and being the founder and president of Himmarshee Surgical Partners, LLC in Fort Lauderdale. Prior to his current role at NSU, Dr. Moon held an appointment as clinical professor of surgery at NSU's Patel College of Osteopathic Medicine. Dr. Moon received a B.A. from Tulane University and an M.D. from the University of South Alabama.

During his time in South Florida, Dr. Moon has established his presence as a civic leader serving as Chairman of the Board of Directors of the Broward Workshop, Governor's appointee to the Florida Gulf Coast Board of Trustees, and on the governing board of numerous business, community and philanthropic organizations.

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**18th Annual
Undergraduate Student Symposium**

April 5, 2019

Abstract Proceedings

**Farquhar Honors College
Nova Southeastern University**

Keynote: Harry K. Moon, M.D.

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A fat mass and obesity-associated gene polymorphism influences fat mass in exercise-trained individuals

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College of Health Care Sciences

Abstract

A single nucleotide polymorphism (SNP) in the fat mass and obesity-associated (FTO) gene is a strong predictor of obesity in humans. The FTO SNP (rs1421085) results in a T to C nucleotide substitution that may result in an increased risk for obesity in individuals who carry at least one C allele. The purpose of this investigation was to characterize the FTO genotype in a cohort of exercise-trained men and women. We tested 108 exercise-trained individuals that included professional mixed martial arts fighters, competitive distance runners, collegiate swimmers, stand-up paddlers as well as a cohort of recreational bodybuilders. Body composition was assessed via dual-energy x-ray absorptiometry (DXA). Saliva samples were collected in order to genotype participants and quantify cortisol levels. The physical characteristics of the subjects were as follows (mean±SD): body weight 74.5±15.6 kg; height 171.5±9.5 cm; bone mineral content 2.8±0.7 kg; fat mass 15.7±5.5 kg; lean body mass 55.9±14.4 kg; % body fat 21.6±7.0. Independent samples t tests showed that C allele carriers (n = 54) had significantly higher fat mass $t(106) = 3.13, p < 0.01$ and body fat percentage $t(106) = 2.68, p < 0.01$, relative to the TT group (n = 54) (i.e., fat mass: C/- 17.3 ±5.6 kg, TT 14.2±4.6 kg; body fat percentage: C/- group 23.4±7.4%, TT group 19.9±6.2). No other measures of body composition were associated with the FTO genotype (i.e., body mineral density, bone mineral content, or lean body mass). Moreover, cortisol levels were significantly higher in the TT group relative to the C allele carriers $t(106) = 2.37, p = 0.02$ (i.e., TT 0.35 ±0.35 µg/dL, C/- 0.22±0.16 µg/dL). Our findings demonstrate a relationship between C allele carriers on the FTO gene and a predisposition to a higher fat mass and body fat percentage. In addition, we found no relationship between cortisol and fat mass. However, due to the cross-sectional nature of this investigation, we cannot infer causality regarding the FTO gene and body composition.

A Study of Pediatric Oral Health in Ahwa, Gujarat, India

Elizabeth Barley

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Halmos College of Natural Sciences and Oceanography

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Public Health

Abstract

Oral health is a critical factor that plays an imperative role in the overall health and well-being of an individual. Dental health requires regular, preventive care at home as well as professional screenings and interventions. The goal of this research is to examine the current need for dental education for children in poor and rural villages in Gujarat, India. Previous research indicates that children aged of 12-15 have not received proper oral health education. This poster will focus on dental health and hygiene of school aged-children treated at the VAD clinic in Ahwa, Gujarat, India, including an oral health education intervention during a medical mission trip in December 2018. By focusing on the most common dental problems in the community among children, the need for oral health education will be amplified, and the barriers that are preventing children in receiving dental treatment will be explained.

Angiotensin II Fragment Receptor Binding in the Mouse Brain

Sarin Itty

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Faculty Sponsor: **Dr. Robert Speth**
Department of Pharmaceutical Sciences
NSU College of Pharmacy

Faculty Sponsor: **Dr. Filipe Stoyell-Conti**
Department of Pharmaceutical Sciences
NSU College of Pharmacy

Abstract

Angiotensin IV (Ang IV), one of the metabolites of Angiotensin II, is a key player within several systems including the kidneys, brain, and other non-traditional locations. It has functions varying from blood flow regulation, stress response, seizures, learning, and memory acquisition. Administration of Ang IV has been shown to increase cerebral microcirculation, elicit cognitive improvements, improve memory, restore cognitive deficits, and combat memory impairment. In our lab, we developed a new peptide that acts on the angiotensin system, ^{127}I -Ang 1-7. Previous studies showed that ^{127}I -Ang 1-7 is less susceptible to metabolism and ~1000-fold more potent than Ang 1-7 in competing for ^{125}I -Ang 1-7 binding. In addition, ^{127}I -Ang 1-7 also competes for ^{125}I -SI-Ang II binding to the AT_1 receptor with moderately high affinity. Thus, the aim of this study was to verify if ^{127}I -Ang 1-7 competes for ^{125}I -Ang IV's binding site (AT_4 receptor) in mouse brains. Competition binding assay showed that ^{127}I -Ang 1-7 competes for ^{125}I -Ang IV binding with a similar IC_{50} to that for the AT_1 receptor. Our data suggests that ^{127}I -Ang 1-7 could be a viable pharmaceutical agent having analogous effects at Ang IV binding sites and potential therapeutic venues include the treatment of cardiovascular and neurodegenerative diseases such as hypertension, Alzheimer's Disease (AD) or Parkinson's Disease.

A Step Forward

Rolando Bolanos

Department of Writing and Communication
College of Arts, Humanities, and Social Sciences

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College of Arts, Humanities, and Social Sciences

Faculty Sponsor: **Eric Garner**
College of Arts, Humanities, and Social Sciences

Faculty Sponsor: **Dr. Weylin Sternglanz**
College of Psychology

Abstract

“A Step Forward” is a documentary about the personal journey about me, as I seek to become an officer of the Coast Guard to not only help pay for college, but to seek opportunities unique to that in the military in order to grow as an individual, begin an ambitious career, and to travel the world. I had encountered many challenges along the way, including a lack of confidence, being overweight, and lacking any titles or experience to help solidify my image as a leader. Despite the challenges, I have managed to not only overcome these obstacles, but I have thus far managed to advance in the program in which I applied for and currently waiting for the results (which will be in by around March 4th) to see if I will be able to begin my journey as a Coast Guardsmen. Regardless of the outcome (which will be presented in the documentary), I have learned a lot through this experience, and I have changed as a person just by preparing for this amazing opportunity. This documentary is directed by myself, Rolando Bolanos.

Am I #MeToo?

Maha Barakat

Department of Writing and Communication
College of Arts, Humanities, and Social Sciences

Faculty Sponsor: **Eric Garner**
College of Arts, Humanities, and Social Sciences

Abstract

In this documentary film, “Am I #MeToo?,” women of three different cultures, religions, and ethnicities will be interviewed regarding their view of the Me Too Movement. I will focus on whether they feel included and/or represented when it comes to modern social movements. The film will also question whether certain communities get left out because of the stereotypes surrounding their identities. The goal of this project is to shed light on which people are actually receiving the help they seek in these social movements. I want to provide an understanding of what empowerment is being sought through these ideologies, and then progress into the reality of whom it satisfies.

Behavior Checklist for Preschool Children with Reading Dogs

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Department of Curriculum and Instruction
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Abstract

The present research looks at how dogs can improve focus and attention during book readings at a preschool to different age groups of students who are learning to read and write. An Achenbach-style behavior checklist will be created and tested for adequate psychometric properties. The distribution of the checklist to different researcher-participants will serve as a method study of inter-rater reliability and intra-rater reliability. The main purpose of this study will be to create a **Behavior Checklist for Preschool Children with Reading Dogs** with high reliability and validity. Additionally, the developmental differences between the different age groups of preschool students will be accounted for through the Checklist scores. The Checklist will be used in future studies to test hypotheses about the impact of reading dogs and other educational systems in improving preschool pre-reading and pre-writing skills. Pre-reading and prewriting skills are important for kindergarten readiness, especially in children living in food and home insecurity.

Bilingualism and Inhibitory Control: The Advantage of Speaking a Second Language

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Department of Psychology and Neuroscience
College of Psychology

Faculty Sponsor: **Dr. Mercedes Fernandez**
Department of Psychology and Neuroscience
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Abstract

Researchers speculate that speaking a second language has benefits that go beyond communicative abilities. Bilingualism has been linked to enhanced performance on executive function (EF) tasks, particularly, those that require inhibitory control. Inhibition is the ability to ignore salient, but distracting, information which may occupy and divert attention from the task at hand. To date, however, the findings have been inconsistent, and one major limitation in the literature is that most studies do not objectively quantify second language proficiency. This study, therefore, used an objective measure of language proficiency and compared bilinguals and monolinguals on tasks that require different levels of inhibitory control. Language groups were matched on socioeconomic status, parental education, non-verbal intellectual abilities, age, and sex. Our findings reveal that bilinguals outperform monolinguals on tasks that require inhibition but not on other tasks of EF that rely less on inhibitory control. In fact, inhibitory control was positively correlated with second language proficiency scores. These findings are consistent with previous work from our laboratory (Fernandez et al., 2013, 2014) that reveals neural inhibitory control advantages in bilinguals and suggests that the same mechanism that controls prepotent responses also controls language output.

Bittersweet Dreams (Are Made of This): Unripe Fruit and Women

Vivian Dang

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Abstract

This paper investigates the role of woman as a medicinal mother in Christina Rossetti's 1862 Christian epic poem "Goblin Market" in which two young sisters, Laura and Lizzie, struggle with temptation as wicked goblin men attempt to coerce them into consuming their forbidden fruit. The marriage market, called the "Goblin Market" in this poem, highlights the inequities between marriage expectations for men and women and the disadvantages faced by the archetypal medicinal mother in the early development of modern medicine. While men are the producers in this misogynistic marriage market, women are not the true consumers because they are the ones being consumed by men's unfair expectations of womanhood and motherhood in a patriarchal society. This dichotomy exposes the harmful view of women as medicinal mothers because it perpetuates the stereotype that women only have value to men in the marriage market if they are pure and fertile. This paper analyzes the importance of women's fertility and the role of breastfeeding in modern medical culture and compares Lizzie to a Christ figure to highlight that women must establish their value in society through their accomplishments rather than by their ability to produce offspring in marriage. Even 157 years after the publication of "Goblin Market," young women still struggle to advance in modern medicine because of the outdated view that they can only be mothers and not doctors, when in actuality women can be both. Today, medicinal mothers are not just the patients, but the doctors as well.

Can You Taste Fat? A Study on the Impact of Fat Perception on Dietary Behaviors and Adiposity

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Faculty Sponsor: **Dr. Jaime Tartar**

Department of Psychology and Neuroscience
College of Psychology

Abstract

Individuals with a higher sensitivity to the perception of fat in foods may benefit from this ability by making healthier food choices. To investigate the impact of fat perception on eating habits and health, we examined participants' daily food intake, adiposity, and ability to distinguish between full-fat and low-fat products. Participants completed a 7-day food diary to measure dietary the amounts of daily fat, sugar, sodium, carbohydrates, protein and caloric intake. Height, weight, and hip circumference measurements were used to calculate body mass index (BMI) and body adiposity index (BAI) values. The participants' perception of fat was measured using a taste test in which they were given two samples of salad dressing, full-fat and low-fat, and were asked to identify the full-fat version. The average fat consumed daily by the participants, according to their self-reported food diary, was compared to their ability to distinguish the difference in total fat in the two samples of salad dressing and their BMI and BAI values. We found that participants with a greater intake of fat were less likely to detect the full-fat salad dressing. This may be because a diet rich in fatty foods increases one's fat taste perception threshold, so they therefore consume more fat dense foods than someone with a lower threshold. Future research will focus on methods that teach individuals to detect levels of fat in foods in order to encourage healthier dietary habits.

Cell-cell communication in bacteria mediated by weak photon emission.

Roodelyne Pierrelus

Behavioral Neuroscience

Halmos College of Natural Sciences and Oceanography

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Department of Biological Sciences

Halmos College of Natural Sciences and Oceanography

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Departments of Psychology & Neuroscience, Computer Science, and Clinical Immunology

Institute for Neuro-Immune Medicine

College of Psychology

Abstract

Cells, including bacteria communicate via multiple routes. Prominent amongst these is through chemical signaling. However, literature dating back to the 1970s has suggested that cells may communicate using electromagnetic forces, including weak photon (light) emission. To date, however, these predictions remain largely theoretical, or lack robust experimental support. In this study, we sought to determine if chemically separated cultures of bacteria could communicate across a boundary that allows light, but not chemical signals, to pass. To address this question, we cultured *Escherichia coli* initiated from either low or high density in an experimental setup that involved growing one population on the inside of a cuvette made of quartz or glass, and a second population growing on the outside. We observed that when a high density population was grown next to a low density population in a quartz cuvette, the growth rate of the low density population was reduced. However, when the quartz cuvette was replaced with a glass cuvette, the growth rate of the low density population was unaffected. Given that glass filters out shorter wavelengths in the ultraviolet (UV) range, and quartz does not, we suspect that any weak photon emission from bacteria is likely occurring in the UV range. Our results serve to establish a foundation where we can identify the wavelengths, weak photon emission process, and genetic consequence of communication via weak photon emission. More generally, these results indicate that cell-to-cell communication through the use of weak photon emission may regulate cell growth, which has implications in our understanding of cellular communication process, and may represent a new therapeutic method to regulate the growth of bacteria.

Comparative investigation of coupling methods to create 2,2'-bipyridine adducts

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Halmos College of Natural Sciences and Oceanography

Kylie Wilkinson

Department of Biology
Halmos College of Natural Sciences and Oceanography

Faculty Sponsor: **Dr. Beatrix Aukszi**

Department of Chemistry
Halmos College of Natural Sciences and Oceanography

Abstract

The project aims to streamline the synthesis of 2,2'-bipyridine adducts, so they can be efficiently synthesized as precursors for ligands in novel organometallic ruthenium complexes. Specifically, the compounds being synthesized are 4,4'-methylated, 4-methylated, 5,5'-methylated, and 5-methylated, 2,2'-bipyridines. Three different synthetic methods will be explored including homo-coupling and cross-coupling reactions as well as the use of a turbo-Grignard reagent. The homo-coupling reaction with or without the turbo-Grignard reagent uses 2-bromo-4-methyl or 2-bromo-5-methyl pyridine as the starting material to produce the 4,4'-methylated adduct or 5,5'-methylated adduct respectively. This is in contrast to the cross-coupling reaction which utilizes a combination of the 2-bromo-4-methyl pyridine and trimethylstannyl-pyridine or 2-bromo-5-methyl pyridine and trimethylstannyl-pyridine to produce either the 4-methylated or 5-methylated adduct. The methodology has been developed to ensure an air-free environment by assembling the closed reaction chamber in a nitrogen glovebox. The reaction is completed on a Schlenk-line assembly under inert argon atmosphere and is monitored by TLC. The product is isolated and purified via extraction and sublimation. Compound characterization is carried out utilizing NMR and FT-IR. The bipyridine building blocks, based on their excellent bidentate ligands with complexing abilities, will be incorporated into ruthenium complexes in a collaborative project, increasing the photosensitivity of these complexes, opening the doors for many applications ranging from synthetic photovoltaics to anti-cancer activity.

Creating Unique 3-D Printed Molecular Models to Explain the Role of HigB Toxin in Cleaving Ribosome-Bound mRNA

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Abstract

The CREST (Connecting Researchers, Educators, and STudents) team at Nova Southeastern University created two physical models depicting the mechanism of endonuclease cleavage by the HigB protein, as described in the literature. Details of the HigB-ribosome complex and its residues for mRNA cleavage were found in the Protein Data Bank file, 4ZSN, and imported into Jmol, a protein visualization software. Specific program commands were developed to manipulate the original file into a format that was later 3D-printed. The models highlight the small ribosomal subunit, ribosomal proteins, tRNA, rRNA, the mRNA strand, and HigB protein along with its residues involved in mRNA cleavage. The N and C termini of the HigB were also indicated. HigB is part of a larger type II toxin (HigB) - antitoxin (HigA) system that cleaves ribosome-bound mRNAs in response to stress. Several bacteria use this mechanism, including *Escherichia coli*, *Pseudomonas aeruginosa*, and *Proteus vulgaris*. Chemical or physical stressors lead to antitoxin (HigA) degradation that releases HigB from the ribosome, inhibiting mRNA cleavage. HigB is of clinical interest due to its importance in mRNA recognition and cleavage in bacteria, thus affecting their survival in a variety of conditions possibly including antibiotics. These 3-D molecular models can be used to explain how ribosome-dependent proteins (HigB) target ribosome-bound mRNAs in bacterial systems and allow students to actively engage in understanding the complex process of endonuclease cleavage. This work was funded in part by NSF-DUE 1725940 for the CREST project.

Desorption Electrospray Ionization Mass Spectrometry Imaging of Human Breast Cancer Spheroids

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Abstract

Endogenous lipid synthesis is up-regulated in cancerous tissue. The role of lipids in oncogene regulation, cancer progression, and tumorigenesis is mostly unknown. It has been well-established that culturing cells in three-dimensions (3D) is a more accurate representation of solid tumors *in vivo* than traditional 2D cultures. 3D cell cultures (spheroids) replicate gas and nutrient diffusion, gene expression, protein concentrations, intracellular interactions, and cell–extracellular matrix connections observed in primary tumors. Herein, we describe a desorption electrospray ionization mass spectrometry imaging (DESI-MSI) method for mapping the spatial distribution of phospholipids (PL) in human breast cancer cell (BCC) spheroids (<1 mm in diameter). This label-free chemical imaging method identified specific PL species and relative percent compositions that may play a role in biological processes occurring at the outer (e.g. invasion and metastasis) and inner regions of solid breast tumors (e.g. angiogenesis). We also compare the PL composition of BCC spheroids with PL profiles of 2D BCC cultures, identifying PL changes specific to the multi-cellular environment of the spheroid.

Disentangling the Effects of PTSD from GWI via a Network Analysis of Cell-Cytokine-Symptom Interactions for Improved Diagnostics and Treatments

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Abstract

A third of the veterans returning from Operation Desert Storm/Shield in the 1990-91 Gulf War reported cognitive dysfunction, skin rashes, musculoskeletal discomfort, and fatigue. This led to the designation of the unique stress-mediated condition Gulf War Illness (GWI). GWI is similar to other known stress-mediated illnesses such as Myalgic Encephalomyelitis/Chronic Fatigue Syndrome in clinical presentation, but as yet we know no concrete understanding of the underlying mechanisms mediating the disease. As such, there are no biological diagnostic to predict the presentation of GWI. Confounding this is the high prevalence of co-morbidity with another war related condition, namely post-traumatic stress disorder (PTSD). To identify more effective treatments and accuracy in correctly identifying illness states, it is imperative that we illuminate the differentiable aspects of such stress-mediated illnesses. This research aims to elucidate the complex interplay existing between immune cells, cytokine signaling and symptom presentations. After self-report symptom questionnaires subjects underwent a graded exercise test to stimulate the stress response. Blood was drawn before, during and after the exercise challenge from healthy controls, GWI subjects without PTSD symptoms, and GWI subjects with PTSD symptoms. Blood was analyzed via flow cytometry, and ELISA cytokine assays. Undirected dependency networks were generated via calculating rank correlation between measures, and compared across conditions via the graph edit distance to assess similarity. The resulting coefficients representing the similarities and dissimilarities between groups can be used to identify potential immune cell signaling pathways related to symptoms that are unique to both GWI alone, and comorbid with PTSD.

Do markers of verbal confidence correlate with effect size in studies of pollution bioindicators?

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Abstract

Bioindicators are organisms whose status or physiological condition are used to assess the effects of stressors such as pollution on ecosystems. Commonly used bioindicators include population-level responses in environmentally sensitive insects (e.g., Ephemeroptera, Plecoptera, and Trichoptera) and fishes (e.g., slimy sculpins, fish larvae), or specific individual-level responses such as EROD enzyme induction or fecundity. Parasites were first proposed as biological indicators of pollution in the 1990s. Parasites are ubiquitous components of aquatic ecosystems, and are known to respond to pollution: while some parasites increase in abundance in polluted areas, most exhibit decreased abundance, and polluted environments typically have species-poor parasite communities. Since the 1990s, more than 500 studies have assessed the use of parasites as bioindicators of pollution, and meta-analyses have confirmed that the associated effect sizes can be significant. Nevertheless, parasites are only rarely included in government-mandated pollution monitoring programs, suggesting that there is a perceptual disconnect between the actual vs. perceived validity of using parasites as bioindicators. To further examine this disconnect, we conducted a meta-analysis of studies of parasite responses to pollution. We calculated mean effect sizes (Cohen's d) for each study; we then used text analysis software (LIWC2015) to quantify verbal markers of author confidence (i.e., affect words indicating positive or negative emotion, and author certainty vs. tentativeness). We then calculated the extent to which the effect sizes were correlated with the authors' language. We also assessed whether authors' perception of the usefulness of parasites as bioindicators has changed over time.

Effect of Standardizing Kick Plate Position on Track Start Biomechanics in Elite Swimmers

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Abstract

In the swimming track start the kick plate position on the starting block is chosen by the level of comfort of the swimmer but may influence performance. Hundredths of a second often determine the winner of short distance races. Therefore, it is crucial for a swimmer to produce a biomechanically sound start. The purpose of this study was to investigate the influence of standardizing kick plate positioning based on shin length on selected biomechanics. 15 swimmers (males, 10; females, 5; age, 21.3 ± 1.7 yrs; height, 1.79 ± 0.08 m; mass, 77.4 ± 10.4 kg) participated in the study. Shin length was measured between the tibia's lateral condyle and lateral malleolus. Participants were filmed with two 120Hz cameras while performing 3 starts at 3 kick plate positions (< shin length, shin length, and > shin length). We determined reaction time, block phase time, flight phase time, flight distance, underwater phase time, and time to the 15 meter mark via Dartfish software. Data were reduced using RM ANOVA, $p < .05$. Only reaction time (RT) was significantly different between the 3 kick plate positions ($F(2,28)=4.713$, $p=.017$). Post-hoc analysis showed RT was lower when kick plate distance was one shin's length versus < shin length (0.173 ± 0.034 vs 0.194 ± 0.061 sec) and > shin length (0.173 ± 0.034 vs 0.195 ± 0.047 sec), $p < .05$. 9/15 (60%) participants produced faster 15 m mark times with the kick plate at one shin' length. Coaches and athletes may consider using shin length as a guide for positioning the kick plate to enhance performance.

Effects of Role Models and Financing Barriers on Women Entrepreneurship

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Abstract

Entrepreneurship has attracted the attention of many and is seen as the economic engine that has the potential to deliver future job growth. Because of this potential it is crucial to identify what drives entrepreneurship. Extant literature has focused on entrepreneurial wealth--sufficient collateral—as a liquidity constraint hindering small business capitalization. Our study empirically investigates the expected linkage between personal wealth constraints and intention to start a business for women entrepreneurs. Further we examine the moderating effect of successful role models on women entrepreneurship. Funded by a research grant, data has been collected in the state of Alabama from women intending to start a business. The data is now analyzed to test the research hypotheses in this study. The student participation is in data analysis and writing of the manuscript under the guidance of two NSU faculty. The data analysis approach uses Baron and Kelly (1986) methodology to assess the statistical significance of moderating variables. Our results, based on a sample of 1200 women intending to start a business in Alabama, reveal that successful role models can inspire potential entrepreneurial aspirants and significantly mitigate the lack of personal wealth and liquidity constraints that thwart business start-ups. Thus, it is important to widely share the success stories of successful entrepreneurs to potential entrepreneurs, especially those who are constrained by constraints of personal wealth. We conclude our study with implications for women entrepreneurs, policy makers and for future research.

Key Words: Women entrepreneurship; Personal wealth constraints; Women Role Models

El Silbo Gomero – An Ancient Language Evolved

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Abstract

Language makes up our identity through tradition and culture. How we communicate in terms of language varies in form and style. The whistling language, El Silbo Gomero, is heard and practiced by the residents of the Canary Islands located in La Gomera. It is not a substitute but a complement to the spoken language that already exists. The whistle makes a sweet tweet and musicality that is quite similar to sounds of birds making it quite easy for the residents of La Gomera to communicate and be heard in their noisy, outdoor environment. The loudness and frequency of the whistle is much more appropriate to utilize than the spoken/shouted voice due to the “Lombard Effect” — a phenomenon in which the shouted voice will reach its “biological limit” quite quickly and the external noise will not allow it to be heard. Humans do not have the extended capacity to withstand and continue the intensity of volume and breath in voice projection over such a vast distance and long-time intervals. This paper provides perspectives from various studies that have researched the whistling language in terms of the phonetics, pitch, tone, projection, and neural processing. Even in today’s day and age, El Silbo Gomero is still being taught and practiced by the youth of the islands. It has become an international language that should be preserved as it is now a piece of art and heritage essential to the identity and traditions of past ancestors.

Entertainment

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Abstract

“Entertainment” is a short narrative film about a serial killer who finds his female victims through dating apps. The story will be told from the perspective of the killer, who films his interactions with his victims, as well as their deaths. The film will deal mostly with what happens when he unexpectedly starts to care about one woman he dates, who he ultimately ends up killing. This film is inspired by how much I hate dating apps and how creepy men on the internet are. Some of my influences are the male serial killers in the television shows “Bates Motel” and “The Fall.” The film is directed by Dekel Nahum. Other crew members and actors include Michael Lynn, Mckinley Alden, Qaas Shoukat, Bryna Alden, and Jessica Pokryfke.

Examining the Antibacterial Properties of Placental Tissue Components

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Abstract

As the use of antibiotics has increased, the rate of antibiotic resistance has grown leading to a pressure to develop new antibiotics. Placental tissue is known to exhibit antimicrobial activity against bacteria, making it a viable candidate for novel antibiotic development. With this knowledge in hand, various components of placental tissue were tested to determine the portions that exhibited antibacterial activity. Dried placental tissue were micronized and rehydrated. The goal of this project was to take the product and test them on multiple bacterial species, some of which are common to human skin. The bacterial species tested were *Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Mycobacterium smegmatis*, and MRSA. The bacteria were inoculated onto nutrient broth, incubated overnight at 37°C, and then diluted in water to match the turbidity of a McFarland Standard. The bacteria were spread on Mueller-Hinton Agar plates and a disk diffusion method was used. Disks with 20 uL of the hydrated tissue were placed on the inoculated plates and incubated at 37°C overnight. Analysis of the plates showed that many of the placental tissues had a zone of inhibition around the disks, which indicated antibacterial activity. To determine whether the components exhibited bactericidal or bacteriostatic properties, bacteria within the zones of inhibition were collected, streaked onto nutrient agar plates and incubated overnight at 37°C. The analysis showed the tissue components had a bacteriostatic mode of inhibition, which indicates its potential in applications intended to promote healing.

Extraction and analysis of volatile biomarkers in oral disease using solid-phase microextraction (SPME)

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Abstract

Sampling volatile biomarkers (odors) from clinical samples is a noninvasive, inexpensive, and effective method for disease detection. Although odor profiles have been utilized for the detection of cancer, acidosis, diabetes, and specific genetic disorders, their role in detecting progressive diseases is unknown. Therefore, the development of effective diagnostic tools using malodors requires technique validation during all stages of disease progression rather than end stage disease. One such progressive disease associated with overall systemic health is periodontal disease. As the 6th most common chronic disease worldwide, the presence of active end stage periodontitis has been associated with autoimmune disorders, cancer, lung infections, and heart disease. Thus, early detection of this progressive disease is the key to maintaining systemic health. The aim of this study was to develop a procedure for optimal extraction and analysis of volatile organic compounds (VOCs) in the various clinical stages of periodontal disease using solid-phase microextraction gas chromatography-mass spectrometry (SPME-GC-MS). A SPME method was developed for optimal compound equilibration, extraction, and desorption times. Then, saliva samples were collected and analyzed from the following periods of disease development: healthy (no active disease present), gingivitis (early disease), and periodontitis (end stage disease). Statistical analyses for extracted VOCs were performed using principal component analysis (PCA). This study reveals critical methodology optimization for analyzing odors in progressive disorders in hopes for better diagnostic tools.

Fashion Law: A Comparative Study of U.S. and European Models

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Abstract

The objective of this research project is to bring to light the lack of protection for fashion designers' intellectual property in a comparative study of intellectual property laws in the United States and the European Union. Legislation and case law surrounding the intellectual property rights of designers in the U.S. enable a culture of "fast fashion" where designs are stolen with ease and mass produced at a low cost to consumers with no legal ramifications. The erosion of intellectual property rights has revealed to have far-reaching ethical implications beyond the injustice the original designer concerning environmental impact and unfair labor practices. To address the root cause of these consequences, there must be an examination of current U.S. intellectual property law with regard to the protection of ownership over originality in the fashion industry. European models of intellectual property laws were constructed to afford greater protections to designers, which is the reason that nations such as Italy and France emerged as fashion capitals of the world. A comparative study of intellectual property laws in the U.S. and in the European Union will reveal the shortcomings of U.S. laws pertaining to the fashion industry and will provide guidance in the adoption of stricter protections to promote creativity, quality, and fair competition.

Functional Movement Pattern Proficiency Is Similar Across Stroke Type Dominance in Collegiate Swimmers

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Abstract

The swimming strokes are different biomechanically and necessitate specific strength and conditioning programs for injury prevention and performance enhancement. Differences may also exist in functional movement pattern proficiency between swimmers of different strokes. The Functional Movement Screen (FMS) identifies dysfunctional movement patterns and consists of seven tests (deep squat, hurdle step, inline lunge, shoulder mobility, active straight leg raise, trunk stability push-up and rotary stability). Results may guide specific corrective exercise programs that could be implemented into team-based strength and conditioning sessions. Therefore, the aim of this study was to examine differences in functional movement pattern performance between stroke dominance in NCAA Division II swimmers. Fifty-seven asymptomatic (31 females, 26 males) NCAA Division II swimmers (age, 19.7 ± 1.4 yrs; height, 174.8 ± 8.5 cm; mass 72.4 ± 10.2 kg) categorized as freestyle (n=21), breaststroke (n=14), backstroke (n=12), butterfly (n=5) or individual medley (n=5) underwent the FMS during their pre-participation examination by FMS-certified staff. Individual tests and composite FMS scores were compared across five stroke groups using Kruskal-Wallis H Test, $p < 0.05$. There were no significant differences between stroke groups in the deep squat ($\chi^2=4.17$, $p=0.38$, $df=4$), hurdle step ($\chi^2=9.03$, $p=0.06$, $df=4$), inline lunge ($\chi^2=7.86$, $p=0.10$, $df=4$), shoulder mobility ($\chi^2=5.03$, $p=0.28$, $df=4$), active straight leg raise ($\chi^2=1.03$, $p=0.91$, $df=4$), trunk stability push-up ($\chi^2=5.17$, $p=0.27$, $df=4$), and rotary stability ($\chi^2=7.06$, $p=0.13$, $df=4$). Functional movement pattern proficiency is similar across stroke types in collegiate swimmers. Therefore, team-based corrective exercise programs based on FMS performance do not need to be stroke specific in swimmers.

Harmful or Helpful?: Helicopter Parenting Among Latina/o Emerging Adults

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Abstract

When young adults enter college, parents sometimes have difficulties relinquishing control over their child. Parents might continue to be overinvolved and oversolicitous in their child's life while in college, which is referred to as helicopter parenting (HP). HP tends to be developmentally inappropriate for college students, who often seek autonomy and independence during this time of emerging adulthood. Controlling parenting in general has been linked to the impostor phenomenon, or impostorism, which involves distressed feelings of being intellectually fraudulent despite being highly capable. However, from the perspective of Latina/o emerging adults (those between 18 and 25 years old), parental control tends to be more normalized and positively perceived compared to emerging adults in more individualistic cultures. Latina/o emerging adults' sense of familism (i.e., obligation and prioritizing of family relationships) may buffer the negative outcomes related to HP because of shared family values between the parent and child. Thus, we hypothesized that the association between HP and impostorism would be moderated by familism in Latina/o emerging adults. That is, the association between HP and impostorism would be weaker for Latina/o emerging adults with greater endorsement of familism than those with lower endorsement. A hierarchical multiple regression was conducted to test this hypothesis.

Have more, stress less: Relating perceptions of stress to accumulation of different types of resources

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Abstract

The concept of a "resource" is central to research in evolutionary biology and psychology. The acquisition, accumulation, and utilization of resources determines an organism's success in terms of both survival and reproduction, and is related to a wide variety of behaviors. Despite their obvious importance, however, "resources" remain ill-defined in the scientific literature. In some cases, the concept of a resource is captured in broad terms such as "resource accruing potential". In other cases, resources are measured in restrictively specific terms, such as parents' level of education, family income, perceived level of social support, group membership, and so on. To address this gap in the literature, we developed a 37 item Resource Inventory (RI-37) to assess a seven factor structure of resources, with six factors representing six distinct types of resources (material capital, cognitive capital, social-relational capital, social-transactional capital, indirect somatic capital, and direct somatic capital) and one factor representing a motivational component (drive). We then used this inventory to investigate individual differences in people's perception and accumulation of these different resources. Specific analyses address questions of sex differences in the value of different resources, and the relationship between the accumulation of various types of resources and the experience of daily stress.

Hollow

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Abstract

“Hollow” is a narrative short about a girl that breaks up with her emotionally abusive boyfriend after countless months of trying to make things work. In the final moments of their relationship, the story explores how it all started, what lead her to this point, and how she copes and perseveres in the aftermath. The film is directed by Amelia Figueroa and Jieun Son. Other crew members and actors involved TBA. The film is meant to be a narrative message about emotionally abusive relationships. More recently in pop culture, there’s been a wave of songs and stories about toxic relationships and people (mostly women) feeling emotionally attached and helpless. In a time when our culture is turning towards accepting toxic relationships as okay, this film is meant to show that it’s not okay. The story is based off of a toxic relationship one of the creators was in, so the knowledge comes from their personal experience. Because of this, we want to make this film to encourage strength to those who know they’re in a bad place to make the decision she did and leave for their own well-being. Sometimes life gets better after casting aside things.

How to Take A Set Mind Out of Mindset

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Abstract

Millennials are said to be the most depressed of any generation (Denizet-Lewis, 2017). This research seeks to explore how expectations in schools may contribute to widespread depression and anxiety among college students (Agliata & Renk, 2009). Recent research has explored how mindset affects your mental, emotional, and physical health: someone with a fixed mindset believes that an individual's qualities and traits are set in stone while someone with a growth mindset believes these qualities can be learned with time and experience (Dweck, 2007). Demonstrating how the way an individual thinks can influence the overall quality of their health in terms of the actions they take to either manage or neglect it. However, health is not the only aspect shaped by mindset. That is, your personality, academics, social life, achievements, and decision making (Powers, 2016) are swayed by your thoughts and can continue to flourish or wither depending on whether you have a fixed or growth mindset. The norms that society sets, along with the expectations and pressures that follow, have the capability to consume people in the struggle to achieve a rigid definition of success and avoid any defining failure. But how do we measure and understand success? How do we measure and understand failure? What types of conditions should be highlighted to create growth and development? This research will examine the effects of having a growth mindset compared to having a fixed one and the implications of colleges and their faculty expecting too much or too little of their students.

Human Angiotensinogen Gene Regulation by Hypoxia Inducible Factor - A cell-based study

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Abstract

Alcohol usage is linked to increased blood pressure and fibrotic transformation of the liver after the hepatocyte death. Angiotensinogen (AGT) is the source of Ang II which is produced from AGT by sequential action of renin followed by angiotensin converting enzyme. The blood AGT levels correlate to blood pressure, therefore, an increase in blood AGT levels result into corresponding increase in Ang II levels affecting blood pressure regulation and liver fibrogenic processes. Alcohol metabolism by the liver produces oxidative stress (ROS) that activates hypoxia inducible transcription factor-1alpha (HIF-1 α). Hepatocytes lose alcohol metabolizing enzymes after passages, therefore HIF-1 α mediated activation of AGT gene was studied by treatment with hypoxia mimetics on AGT secretion by hepatocytes. It was observed that AGT secretion levels were increased with HepG2 and Huh7 hepatocytes after deferoxamine (60nM and 120 nM) and cobalt chloride (10mM and 20mM) post four- and six-hours treatments. The increased secretion of AGT was sustained till 24 hrs. by HepG2 cells followed by decreased secretion at 48 hrs. as compare to control. The cellular level of AGT were also increased till 24 hrs. followed by a decrease at 48 hrs. by HepG2 cells. The presence of hypoxia response element(s) (HREs; RCGTG) in hAGT -10.0 kb promoter was analyzed using ApoE program and a total of 13 HREs were found. It is likely that hypoxia mimetics increase angiotensinogen secretion through HREs and these HREs may cause increased AGT secretion from hepatocytes after ethanol exposure and other hypoxic conditions such as tumors environment.

Human gut microbiome composition is associated with perceived stress and cortisol.

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Abstract

Recent research on the gut microbiome is calling attention to the role that the microbiome-gut-brain axis (MGBA) plays in influencing behavior. One particularly exciting, yet understudied, function of the MGBA is that alterations to the microbiome can increase stress susceptibility through increasing psychological vulnerability. While this notion is interesting, it remains largely unexplored in humans likely owing to the complex, multidisciplinary approach required to provide evidence for such a hypothesis. The current study sought to shed light on this uncertainty through connecting measures of stress and cognition in humans with gut microbiome composition. Seventeen male participants (mean age = 24, SD = 4.2) were tested on emotion assessments from the NIH Toolbox and on a battery of cognitive tests (Joggle, LLC). Participants also provided a saliva sample and a blood sample for biomarkers of stress (cortisol and sAA) and inflammation (IL-6, IL-1 β , CRP). Fecal swab samples were provided for an analysis of gut microbiome composition using the MoBio BioStic kit following the manufacturer's protocol. We found that gut microbiome diversity (Shannon diversity) was significantly negatively correlated to cortisol levels ($r = -0.70$, $p = 0.003$) and perceived stress levels ($r = -0.51$, $p = 0.04$). Random forest regression model revealed several specific taxa that correlated with cortisol and perceived stress. Surprisingly, and in contrast to rodent research, our markers of inflammation did not relate to either stress or microbiota measures. Findings from this study can provide a foundation for targeted probiotic-based therapies and directed autogenic therapy aimed stress regulation.

Ibrutinib Inhibits Human CD4 T Cell Proliferation

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Abstract

Ibrutinib, is an orally active agent, which works by covalent irreversible binding to the kinase domain of Bruton's Tyrosine Kinase (BTK). The drug is of central importance in B cell receptor signaling and is currently used to treat B cells cancers like Chronic Lymphocytic Leukemia and B Cell Lymphoma. In addition to BTK inhibition, it has been hypothesized that Ibrutinib is a target of Interleukin-2 Inducible Kinase (ITK), which is an active agent in T cell malignancies survival and proliferation. The purpose of this experiment was to determine the effect of Ibrutinib on human T cells. Peripheral blood mononuclear cells (PBMCs) were isolated, activated, and analyzed using Carboxyfluorescein succinimidyl ester (CFSE) proliferation assay and Fluorescence-activated cell sorting (FACS) analysis in presence and absence of the drug, Ibrutinib, at different concentrations. Our results indicate that Ibrutinib inhibits T-cell proliferation, in particular, CD4 T cells. The inhibition was noted as being dose dependent. In overall, our findings demonstrate the significance of Ibrutinib as an Interleukin-2 Inducible Kinase inhibitor and could lead to potential new therapeutic uses for the treatment of T cell malignancies. Moreover, Ibrutinib could aid in the treatment of B cell malignancies by two different mechanisms, BTK and ITK inhibition.

Improving Hygiene Behaviors Among Rural School-Aged Children: A Public Health Education Program in Dang District, Gujarat, India

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Abstract

In India, over two million children die each year from preventable diseases. Poverty, malnutrition, poor sanitation, and unhygienic environment all contribute to alarming child mortality rates. Millions of lives could be saved with proper hygiene education and sanitation, especially in poor and underserved communities. This poster presents the results of an intervention to educate and encourage hygiene behaviors like washing hands, brushing teeth, cutting nails, and bathing among children. Participants were pediatric patients that presented to the NSU-KPCOM medical clinic camp at the Vanbandhu Arogya Dham community health center in the Ahwa, Dang District of India. Results also highlight the prevalence of the chief complaints of pediatric patients as it relates to hygiene. Results of this research will provide data to improve future hygiene and education projects to this area. Information will be also be shared with the medical staff regarding rates of hygiene-related illnesses among children.

Influence of Diisopropyl Fluorophosphate, an Irreversible Cholinesterase Inhibitor, on Autonomic Modulation

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Abstract

After the Gulf War, approximately 25-32% of the 700,000 veterans deployed are still facing cardiovascular issues, joint pain and muscle pain, neurophysiological problems, and various symptoms that cannot be medically explained. These medical mysteries are commonly known as Gulf War Illness (GWI). It is important to know that understanding how these various symptoms are related allows for treatment as veterans return back to civilian life, preventing exposure to further diseases. In this study we used mice that were exposed to diisopropyl fluorophosphate (DFP), a cholinesterase inhibitor that can be used as a substitute for sarin gas, which was used during the Gulf War. Acutely, DFP can increase the parasympathetic modulation by inhibiting the enzyme acetylcholinesterase; however, the chronic effects are not known. Heart rate variability is a tool that allows us to indirectly measure the autonomic modulation. It is worth noting that diseases influence a higher sympathetic modulation than normal. In this study, the animals exposed to DFP showed a lower parasympathetic modulation (-33%) which in turn led to a higher sympathovagal balance when compared to the control group. This implies that DFP contributes to alterations in cardiac autonomic modulation. Further research is required, but at least some of the mechanisms were understood as to how sarin gas could have influenced the cardiac dysfunction associated with GWI.

Measuring the Difference Volunteers Make: An Evaluation of a Residential Air Quality Program in San Miguel, Costa Rica

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Abstract

The purpose of this trip is to serve the residents in the slums of Los Lagos through home renovation work. The public health topic surrounds community and environment improvement. The task is to build two wood-burning stoves and convert two houses from dirt floors to wooden (pallet) floors. There will be little side projects, that the trip participants will complete as needed by each individual family home. This includes painting houses and gardening work. Currently, only a few families have stoves in their homes. The wood-burning stoves that will be built are EPA-certified and thus burn more efficiently. The objective is to evaluate the success of this community improvement program. Diseases of the respiratory system are in the top ten leading causes of death in Costa Rica. Prolonged exposure to smoke from wood-burning stoves, especially in poorly ventilated houses, is a risk factor for respiratory illnesses. This poster presents the results of an evaluation of a community program to improve residential air quality by building EPA-certified stoves in an income-poor area of San Miguel, Costa Rica. The objective of this research is to evaluate program and student volunteers on the difference they make in people's lives and the greater community. Focused interviews and impact assessments will be utilized to measure the completion of program objectives and volunteer's perceptions of impact on the target population. Results of this research will be used to inform future service-learning opportunities to this region.

Memory and attention while SCUBA diving

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Abstract

There is a high level of cognitive functioning required by SCUBA diving given the task loading that divers experience. Poor memory and attentional skills are reported by divers while under water, especially as the depth of the dive increases. In this study, participants completed both shallow (8 m) and deep (28 m) dives. Participants learned and were tested on a list of 36 words, completed the trail making task to assess executive functioning, and completed the State-Trait Anxiety Inventory to assess anxiety levels. The Profile of Mood States survey was also completed and they provided saliva samples to measure cortisol levels before and after each dive. Participants displayed elevated cortisol levels, remembered fewer words, and had worse executive control during a deep dive. Dive depth did not affect the subjective experience of anxiety and motor control ability. The results of the study suggested that deep dives can lead to quantifiable cognitive deficits.

Metabolic Inactivation of Angiotensin 1-7 (Ang 1-7)

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Abstract

The renin-angiotensin system (RAS) plays a role in the control of the cardiovascular system by modulating blood pressure. While Angiotensin II (Ang II) serves as a vasoconstrictor and is the most well-known of the RAS peptides, Angiotensin 1-7 (Ang 1-7) is a peptide gaining interest in its counter-effects to Ang II and may serve as its antagonist. However, the rapid metabolism and subsequent inactivation of Ang 1-7 precludes its use in radioactive binding assays. For this reason, peptidase inhibitors were added to assays involving ^{125}I -Ang1-7 or an analog ^{125}I -alamandine. This study uses high pressure liquid chromatography (HPLC) to determine the metabolism of Ang1-7 under conditions of the receptor binding assay. To protect the Ang1-7 from metabolic enzymes, enzyme inhibitors were added. While these inhibitors partially protected Ang1-7 from metabolic inactivation, they also prevented ^{125}I -Ang1-7 from binding to its receptor, which precludes doing proper receptor binding assays. Therefore, this experiment studied the interaction of ^{125}I Ang1-7 with its binding sites, which may be enzymes rather than receptors. A further objective is to determine the metabolism of non-radioactive ^{127}I -Ang1-7 and the possibility that ^{127}I -Ang 1-7 could protect Ang1-7 from metabolic inactivation. These studies will provide insight on the receptor for Ang1-7 and the binding site for radioactive, ^{125}I -Ang1-7. Potential therapeutic significance resulting from these studies could be the ability of non-radioactive ^{127}I -Ang1-7 to protect Ang1-7 from metabolic degradation.

Mind Wandering: The Powerful Effects of Mindfulness Meditation

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Abstract

The contents of one's thoughts can be very powerful. Mind wandering refers to thoughts that are off-task. Negative task-unrelated thoughts (TUTs) decrease sustained attention task performance. Mind wandering leads to a decrease in reading comprehension and working memory, which can negatively impact workplace, academic, and daily performances. Mindfulness meditation training increases sustained attention on the present and decreases attention on the past and future. Specifically, meditation training decreases mind wandering reports. The current study tested whether a brief fifteen minute mindfulness induction could moderate the effect of the negative affect manipulation on a sustained attention task. Participants were randomly assigned to a mindfulness, relaxation, or control conditions. Participants listened to an induction based on their condition: meditation, relaxation, or no recording. To induce negative affect, participants completed a writing task in which they wrote about a negative life event that still troubled them. Next, participants completed a sustained attention task (SART) with thought probes to assess the content of their thoughts. SART performance did not vary across conditions. However, negatively valenced mind wandering varied by condition and was lower in the mindfulness condition, $F(2, 84) = 3.23, p = .045$, partial $\eta^2 = .07$. Negatively valenced mind wandering was associated with poorer performance in the control ($\beta = -0.46, p = .009$) and relaxation ($\beta = -0.71, p = .001$) conditions but not in the mindfulness ($\beta = -0.25, p = .175$) condition. Mindfulness appears to reduce negative TUTs and reduce the impact of negative TUTs on task performance.

Mind Your Thoughts: Individual Differences in Mind Wandering

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Abstract

Mind wandering consumes almost half of our day, while influencing behaviors and activities experienced throughout individuals' lives (Killingsworth & Gilbert, 2010). The impact of mind wandering on task performance may vary but typically, task performance is impaired when people mind wander (Randall, Oswald, & Beier, 2014). The current study examined predictors of mind wandering in both the laboratory and the real world. New to this study we examined mind wandering across two dimensions: emotional valence and intentionality. To measure mind wandering in the lab, participants completed a sustained attention task with thought probes. Mind wandering in the real world was measured via responses to a signal on an iPod Touch that participants kept with them for one week. Results indicated that personality factors of openness to experience and conscientiousness predicted negatively valenced, intentional Task-Unrelated Thoughts (TUTs) mind wandering in the lab. Further, mindfulness, neuroticism, and self-reported trait tendency to mind wandering predicted TUT rate, however, these predictors varied based on intentionality of the mind wandering. Positively valenced TUTs were not predicted by any personality or other trait measure. Predictors of mind wandering in the real world differed from predictors of mind wandering in the lab. Mind wandering in the real world was predicted by situational factors including boredom, concentration, and happiness. The predictors of mind wandering appear to vary by setting and may be contingent upon certain individual difference variables. Understanding the predictors of mind wandering is critical to identifying when task performance may be impaired.

Muscle Fatigue Analysis During Welding Tasks Using sEMG And Recurrence Quantification Analysis

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Abstract

This study is a quantitative investigation of the task and muscle activity related to welding through real-time surface electromyography (sEMG) to identify ways to prevent work-related musculoskeletal disorders (WMSDs) related to welding. Six right-hand dominant participants simulated two different welding tasks to conduct research on 16 muscle groups for three hours. To analyze this data, recurrence quantification analysis (RQA) is used to detect muscle fatigue during the welding task. Average DET% values were calculated among all the participants to find out the determinism values of the first and last 10 min of the experiment for each muscle. The highest difference in DET% between the last 10 minutes and first 10 minutes was the left upper trapezius (39.7%). The next three highest differences were the right upper trapezius (39.5%), left medial gastrocnemius (32.7%), and right deltoid (27.5%). According to the subjective average values, the right deltoid was the muscle group fastest to fatigue at 40 minutes. In the future we hope to work to better identify and learn how to prevent muscle fatigue in welding workers by optimizing workstations and equipment and implementing new designs and processes.

Parasites of raptorial birds of South Florida

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Abstract

Raptors are a polyphyletic group of birds characterized by predatory behavior and physiology. They regulate small mammal and reptile populations, playing key roles in local ecosystems as apex predators; as such, they are themselves largely regulated by their parasites. However, little is known regarding the species composition and structure of their endoparasite communities. To address this knowledge gap, we surveyed endoparasites of southeast Florida raptors: American kestrels (*Falco sparverius*), peregrine falcons (*F. peregrinus*), merlins (*F. columbarius*), Cooper's hawks (*Accipiter cooperii*), sharp-shinned hawks (*A. striatus*), red-shouldered hawks (*Buteo jamaicensis*), broadwing hawks (*B. platypterus*), and turkey vultures (*Cathartes aura*). As of February 2019, 58 birds had been examined, and almost all were infected with at least one parasite taxon; raptor parasite communities were diverse, including members of Digenea (primarily strigeids), Cestoda, Nematoda (primarily anisakids and spirurids), and Acanthocephala. Parasite species diversity varied among hosts: red-shouldered hawks had both the most diverse and heaviest parasite burdens, while turkey vultures had the least diverse parasite community and generally the lightest parasite load. This study features several new host records and range extensions, including: first report of nematodes in turkey vultures; first report of nematodes and strigeid digeneans in merlins; first records and a range extension for Acanthocephala in sharp-shinned hawks and Cooper's hawks. The implications of these results on raptor health and ecology are discussed. Many raptors are protected species, and information on the parasite communities that regulate them will inform conservation and management efforts.

Parents: To or Not to Genetically Enhance Children

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Abstract

Genetic therapy and genetic enhancement technology are not only developing at a rapid rate, but are also now, as proven by a Chinese scientist's recent breakthrough, being utilized for unnecessary purposes, reasons beyond disease prevention and treatment. This development both drives society's concern for ethical use of genetic technology and presents issues that society must immediately address. This work acknowledges the ethical concerns society has regarding genetic enhancement and subsequently analyzes a significant consequence that would come about were said practice implemented. This analysis of genetic enhancement's morality is carried out from an ethics of care perspective, with a particular focus on genetic enhancement's power to fundamentally change the parent-child relationship. This work rejects parental imposition of genetic enhancement on future children, regarding such behavior as unethical and immoral.

Key words: genetic enhancement, genetic therapy, care ethics, parent-child relationship

Patterns of foraging on dead birds in a coastal mangrove environment

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Abstract

South Florida falls along the Atlantic Flyway, the migratory route for numerous North American bird species. In particular, the coastal ecosystem of South Florida provides habitat, protection and a food resource. However, the migration is energetically taxing and the mortality rate of these birds is unknown. One way to evaluate mortality is to monitor the number of carcasses, but bird carcasses are rarely observed in South Florida coastal habitats, presumably due to a high rate of carcass scavenging. To address this knowledge gap, infrared automatic game cameras at stations baited with frozen feeder chicks (to simulate dead migratory birds) were used to assess the scavenging communities in three common South Florida coastal sub-habitats: (1) wet mud areas around the roots of mid-/high tideline red mangrove *Rhizophora mangle* and black mangrove *Avicennia germinans*, (2) permanently dry grounds above the high tideline around invasive Australian pine trees *Casuarina equisetifolia*, and (3) high-ground coastal scrub habitat. Other than one chick buried overnight by an ant colony, all carcasses were removed within 24 hours of initial deployment. The game cameras have shown three vertebrate species scavenging the carcasses placed in all three habitats: opossum *Didelphis virginiana*, northern raccoon *Procyon lotor*, and marsh rat *Oryzomys palustris*. Only one feral housecat *Felis catus* was seen in the camera deployments, although individuals are known to reside locally. Data for carcass scavenging in mangrove habitats in South Florida will provide a better understanding of migratory bird populations and their local mortality rates.

Population dynamics of branching corals *Pocillopora* spp. in Devil's Crown, Galápagos Islands, Ecuador

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Abstract

Corals in the genus *Pocillopora* (e.g. *P. elegans* and *P. damicornis*) are important reef constructors in the Eastern Tropical Pacific. *Pocillopora* spp. are also susceptible to bleaching and mortality from temperature shifts associated with El Niño-Southern Oscillation events, affecting their contribution to benthic community structure. Colony numbers and live tissue surface area have been monitored at Devil's Crown, Galápagos Islands for the past 36 years (1983–2017). This project quantifies the data collected in 2017, in preparation for another site visit in May 2019. In previous analyses, colony numbers ranged from 0 (1983–1995) to a maximum of 154 colonies in 2007. A decrease to 11 colonies occurred in 2009 followed by a small increase to 20 in 2011. Live tissue area ranged from 0 cm² (1983–1995) to a maximum of 37,772 cm² in 2007. This project quantifies numbers and cover from the next data set obtained in 2017 following a 6-year hiatus. Preliminary analysis suggests 1) more than an eightfold increase in the colony count from 2011, and 2) an approximately 150% increase in live tissue area from 2007, formerly the highest year in terms of cover. Variations in colony counts and live tissue area will be correlated with *in situ* sea water temperature data to better elucidate this important dynamic. This research continues the long-term data set on *Pocillopora* resilience and recovery, providing a view into changing conditions for corals and insight on ways to promote survivorship in the years to come.

Pre-reading and Prewriting in Prekindergarten

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Abstract

The present research looks at the behaviors associated with the stages before actual reading and writing in 4-5 year old preschoolers. An Achenbach-style behavior checklist will be created and tested for adequate psychometric properties. The main purpose of this study will be to create a Pre-reading and Prewriting Behavior Checklist with high reliability and validity. The Checklist will be used and verified by multiple independent observers. In future studies, it will be used to test hypotheses for improving preschool development of reading and writing skills. Pre-reading and prewriting skills are important for kindergarten readiness and further academic success, especially in children living for food and home insecurity.

Presenting Complaints Among Women Who Present to a Community Health Center in Gujarat, India

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Abstract

Little is known about the frequency of presenting problems among women in rural areas of Gujarat, India have not been reported or investigated carefully. The objective of this secondary data analysis is to determine the prevalence of presenting problems among women who presented to Dr. Kiran C. Patel Multi-Specialty Hospital in Ahwa, Dang District in Gujarat, India. Demographic and descriptive statistics are presented for the analysis of reports of primary complaints recorded in patient charts over a 6-day time period (December 10-14, 2018). Patients were classified by age, gender, chief complaint, and BMI. Results of this research will inform future medical mission and global outreach projects to improved healthcare among women who present to the Dr. Kiran C. Patel Multi-Specialty Hospital in Gujarat, India. It can also provide valuable information pertaining to gender stratification of health in Gujarat, India.

Public and Private Effects of Cooperation on Survival and Growth

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Abstract

Cooperation plays a significant role in all aspects of life where multiple individuals interact for the purpose of survival. Cheaters do not pay the cost of cooperation and they can take advantage of cooperators. In theory, cheating should undermine cooperation as an evolutionary stable strategy. However, cooperation continues to persist in multiple biological systems. One possibility to explain the stability of cooperation is the use of an impure public good. This public good can be shared amongst everyone in a population (providing a public benefit), and is used to facilitate cooperation. However, there is a private benefit of this public good that redounds only to the producer. Though theoretically possible, there is a lack of experimental information demonstrating how the public and private benefit of a public good affect the survival of populations. To address this question, we used simulations coupled with experiments using a microbial cooperator-cheater system. Using *Escherichia coli* that express a β -lactamase public good, we determined how the contributions of the public and private benefit regulate population collapse. We observed that our microbial populations were most sensitive to collapse when initiated at an intermediate fraction of cooperators. Decreasing the private benefit of β -lactamase expression increased the maximum sensitivity to population collapse. Using both colony forming unit measurements and simulations, we show that the near simultaneous collapse of both cooperator and cheater populations leads to increased sensitivity. Our findings demonstrate the significance of public and private benefits in relation to populations that rely on cooperation for survival.

Quantifying Neuronal Damage via Immunofluorescence Staining in Chemotherapy Induced Peripheral Neuropathy (CIPN)

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Abstract

Multiple myeloma is the second most common hematological cancer of plasma cells and Bortezomib (BTZ), a proteasome inhibitor, is commonly used to treat this condition. BTZ causes debilitating Chemotherapy Induced Peripheral Neuropathy (CIPN) that results in the dose limitation or discontinuation of chemotherapy. Our study focuses on determining BTZ induced neuronal damage using PC-12 cells, derived from pheochromocytoma found in rats. PC-12 cells qualify as a viable *in vitro* neuronal model due to their ability to differentiate into neurons with the addition of nerve growth factor (NGF). The neuronal markers including TUBB3 (β -Tubulin), GFAP (Glial Fibrillary Acidic Protein), MBP (Myelin Basic Protein) and NeuN (Neuronal nuclei) were used in immunochemical staining to confirm differentiated PC-12 cells' neuronal lineage. High expression of the biomarkers (CREB and NSE) was observed using protein quantification techniques (Western Blot), confirming significant neuronal damage in the BTZ-treated PC-12 cells. Additionally, immunofluorescence staining was used to measure the neuronal damage induced by BTZ. Immunofluorescent staining of the damaged neurons under a fluorescence microscope, allowed us to accurately characterize and quantify the changes in neurite outgrowth, in response to chemotherapeutic agents as well as potential neuroprotective treatments. Furthermore, our results will be used to measure the effectiveness of

neuroprotective treatments such as vitamin B12, gamma linolenic acid (GLA), and neuronal nitric oxide synthase (nNOS) inhibitor. (This project was supported by the President's Faculty Research and Development Grant from NSU and the generous financial support from The Royal Dames of Cancer Research Inc., Ft. Lauderdale, Florida).

Rate of Phosphate Uptake by Periphyton in the Everglades

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Abstract

Periphyton is an essential source of primary productivity and plays a major role in the removal and short-term storage of phosphorus in the Florida Everglades. In recent decades, runoff from the Everglades Agricultural Area has caused a serious nutrient pollution problem. In the oligotrophic wetlands, the increase of phosphorus leads to the growth of species that disrupts the ecosystem. In order to gauge the response of periphyton to these environmental changes, the rate of phosphate uptake by epipelton, metaphyton, and epiphyton mats are measured following spikes of either 150, 500, or 1000 ppb of potassium phosphate. The experiment was conducted twice, the first round measured the decline in phosphate every 30 minutes over a 150-minute period, and in the second round samples were taken every 10 minutes for 1 hour. The concentration of phosphate in the water samples was determined through the ascorbic acid method and a UV-Vis spectrophotometer. Dry weight of each periphyton mat was used to standardize the uptake rates of phosphate. Results indicate that uptake rates increase with initial phosphate concentration, and epiphyton have higher rates of phosphate uptake than the other types of periphyton. Determining potential sources of phosphorus fluxes, such as precipitation and canal openings, provided insight to the response of periphyton to changes within the Everglades ecosystem.

Relationship between Countermovement Jump Power and Kick Start Biomechanics in Elite Swimmers

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Abstract

The counter movement jump (CMJ) is a commonly used test to assess lower body power. It has been shown carryover to grab and track start performances in swimming despite the fact the CMJ is performed vertically and starts are performed horizontally. Kick starts use an adjustable inclined footrest. It is unknown if CMJ is associated with kick start biomechanics. The purpose of this study was to determine the relationship between CMJ and kick start performance. Fourteen elite swimmers (males, 9; females, 5; age, 21.3 ± 1.7 yrs; height, 1.79 ± 0.08 m; mass, 77.1 ± 10.7 kg) participated. CMJ height was obtained using a Vertec device. CMJ peak power was calculated using a Harman formula. Participants performed 3 kick starts while being filmed by two 120Hz cameras. Reaction time (RT), block time (BT), flight time (FT), flight distance (FD), underwater time (UWT), and time to the 15 m mark were derived using Dartfish motion analysis software. Pearson correlation coefficients were used to determine associations between the variables, $p < .05$. Mean CMJ height and power were 0.58 ± 0.08 m and 8190.82 ± 752.81 W, respectively. Mean RT = 0.17 ± 0.04 sec, BT = 0.70 ± 0.05 sec, FT = 0.31 ± 0.08 sec, FD = 2.39 ± 0.23 m, UWT = $4.00 \pm .89$, and time to the 15 m was 6.78 ± 0.47 sec. CMJ height and peak power were positively and strongly associated with FD, $r = .697$, $p = .006$ and $r = .706$, $p = .005$, respectively. Swimmers with better CMJ performance had longer FD during the start. Use of the CMJ for lower body power assessment appears meaningful for swimmers since it relates positively to a kick start component.

Relationship between Stance Phase Frontal Plane Kinematics and Initial Impact Forces in Collegiate Cross Country Runners

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Abstract

Rearfoot eversion (REV) and contralateral pelvis drop (CPD) play a crucial role in force absorption at impact during running. Controlling and adequately absorbing the repetitive vertical ground reaction force (vGRF) at impact is essential in injury prevention. **PURPOSE:** This study aimed to examine the relationships between vGRF and REV, and vGRF and CPD bilaterally in collegiate cross country runners. **METHODS:** Eleven asymptomatic (5 females, 6 males) NCAA Division II cross country runners (age, 19.1 ± 1.1 yrs; height, 174.2 ± 11.2 cm; mass 62.2 ± 6.2 kg; 38.3 ± 15.9 miles/wk, treadmill speed, 3.6 ± 0.5 m/s) underwent 3D motion analysis during a 7 minute steady state run on an instrumented treadmill. vGRF, REV and CPD were evaluated bilaterally for association via Pearson Correlation coefficients, $p < .05$. **RESULTS:** Mean (\pm SD) peak angles of REV and CPD, and vGRF during left stance were $3.6 \pm 6.5^\circ$, $-5.4 \pm 3.8^\circ$, and 1.8 ± 0.6 body weights (BW), respectively. Mean peak angles of REV and CPD, and vGRF during right stance were $2.51 \pm 2.5^\circ$, $-4.9 \pm 4.9^\circ$, and 1.6 ± 0.4 BW, respectively. Significant high negative correlation was found for REV and vGRF during left stance [$r(9) = -.967, p=0.03$] while CPD and vGRF during right stance were significantly highly positively correlated [$r(9) .714, p=0.02$]. **CONCLUSION:** Despite the low number of subjects, we conclude that frontal plane kinematics are associated with impact force magnitude during running, and the associations appear to be asymmetrical necessitating a bilateral examination of running mechanics.

Release Kinetics of Anti-Sema4D Monoclonal Antibody from Alginate Beads

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Abstract

Background/Introduction: The reconstruction of bone in critical size defects presents clinical challenges in cranio and oral maxillofacial surgery. The long-term goal of this project is to regenerate a resilient bone for the repair of these defects. A recent study revealed that Semaphorin 4D (Sema4D), a pleiotropic transmembrane glycoprotein, expressed by osteoclasts inhibits osteoblast differentiation. Our hypothesis holds that local delivery of anti-Sema4D monoclonal antibody (mAb) adjunct to bone-regenerative cell-therapy may enhance osteoblast differentiation. However, currently, no methodology is available for the local mAb delivery. In this study, we intended to develop a novel alginate-based anti-Sema4D-mAb delivery system. **Objective:** The objective of the study is to examine the release kinetics of anti-Sema4D-mAb from alginate beads. **Materials/Methods:** Alginate beads (2% alginate) containing various concentrations (0, 5 and 10 μg) of anti-Sema4D-mAb, generated by Dr. Kawai's group (College of Dental Medicine, NSU) were prepared. Anti-Sema4D-mAb embedded beads in PBS were incubated in a 6-well culture-plate at 37°C. The release of anti-Sema4D mAb after incubation for various periods (1-120 hrs) was measured by ELISA using a Sema4D-peptide as target antigen. **Results:** There was a steady increase of anti-Sema4D-mAb release from alginate beads which peaked at 24 hours, followed by a gradual decrease in the release at 30-120 hours which still maintained at least 30% level compared to its peak. Furthermore, positive reaction in Sema4D peptide ELISA indicated that anti-Sema4D-mAb's binding function was retained in alginate beads. **Conclusion:** Alginate appeared to be an excellent biomaterial for the extended release of anti-Sema4D-mAb.

Risk: Health and Self Control

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H. Wayne Huizenga College of Business and Entrepreneurship

Abstract

Assessing the frequency with which college students undertake behaviors that have long - lasting health impacts could help us establish better preventative programs on campuses. This research will review risky decisions associated with nutrition, sleep habits, chemically-altering substances and their use, sexual safety, and general self-preservation. People are more prone to exhibiting impatience with short-term decisions, while too much patience for long-term decisions (Mullainathan & Thaler, 2000), therefore students may undertake future risk due to present impatience and underestimation of the weight of the future risk. The purpose of this research is to specify where and what decisions are being made day-to-day that entail underestimated risk. *Underreaction* happens frequently with short-term horizons (Thaler & De Bondt, 1985). Therefore, it is important to analyze these risky short-term decisions made by college students in order to accurately provide the necessary aid and instruction to their very natural shortcomings; and thus avoiding the underreaction to the present problem.

Spero

Samantha Villarroel

Department of Writing and Communication
College of Arts, Humanities, and Social Sciences

Faculty Sponsors: **Prof. Stephen Andon**
College of Arts, Humanities, and Social Sciences

Abstract

“Spero” is a short film about a woman who forgets about her passion but is reminded through her memories and finds the importance of self-happiness. The film is directed by Samantha Villarroel. Other crew members and actors include Julian Glasthal, Dekel Nahum, and Zach Matthews.

The Fat Mass and Obesity-Associated Gene (FTO): Can You Overcome Bad Genetics With Diet?

Madaline Kenyon

Exercise and Sport Science
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Neuroscience
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Abstract

A single nucleotide polymorphism (SNP) in the fat mass and obesity-associated (FTO) gene is a strong predictor of obesity in humans. The FTO SNP (rs1421085) results in a T to C nucleotide substitution that may result in an increased risk for obesity in individuals who carry at least one C allele. The purpose of this investigation was to determine if body composition alterations after a 4-week diet differed between those who carried the risky C allele versus those that did not. Thirty two exercise-trained subjects completed a 4-week hypocaloric diet (i.e., decreased energy intake by ~20% from baseline). After the 4-week treatment period, there was a significant decrease in fat mass and % body fat. However, there was no change in lean body mass or total body water. Furthermore, when we examined those with the risky C allele (C/- was comprised of CC homozygotes and CT heterozygotes) versus the TT homozygotes (normal risk), there was no between group difference regarding the loss of fat mass. Thus, the evidence suggests that despite having the risky C allele for the FTO gene, a decrease in energy intake produces a similar response compared to those at normal risk for obesity.

The Myth of the Mother: Gender Stereotypes in Custody Decisions

Anna Susol

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Faculty Sponsor: **Dr. Kathleen Waites**

Department of Literature and Modern Language
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Abstract

Today, the United States custody system operates under gender-neutral policies, in which the gender of a parent may not be used as a determinant for custody. However, maternal preference, or the tendency for judges to award custody more often to mothers than fathers, is a commonplace practice in the current legal system. This study examines the history of changing custody preferences in order to understand why, in the age of gender equality, the imbalance persists. Historically, custody preferences in the legal system reflect the cultural ethos of a patriarchal society, but major shifts owing to the industrial revolution and in the wake of the women's rights movement altered the social and legal landscapes. This study discusses how those cultural shifts have changed societal perceptions of gender roles and parenting abilities and responsibilities based on sex and, in turn, influenced the custody system. Through an understanding of history, this study examines the implications of gender and sex stereotypes, and how they result in the oppression of women and discrimination against fathers in the allegedly gender-neutral custody system.

The Universal Mass Function and its Applicability to Non-Cosmic Objects

Kyle Hansotia

Department of Chemistry and Physics
Department of Biological Sciences
Halmos College of Natural Sciences and Oceanography

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Abstract

The universe is full of mysteries. One of these mysteries is that all objects in the cosmos—from the smallest meteors to the largest galaxy clusters—are all connected with a single mass function. This mass function is a power law with a constant slope, $f(m) = k m^{-2}$ where m is mass and k is a normalization constant (Binggeli & Hascher 2007, "Is there a Universal Mass Function?" *Publications of the Astronomical Society of the Pacific*, 119, 592). This means that objects with low masses are much more common than massive objects, and that the fraction of low-to-high mass objects is enigmatically universal on all cosmic scales. This is quite puzzling, as no current theories exist in physics explaining the phenomenon of mass assembly in a unified manner that ranges vast magnitudes, from very small to extremely massive objects. A mass function was created from the pieces of Razor the Shark—NSU's mascot in LEGO representation. A power-law mass function was applied to the LEGO-bricks measurements and compared to the findings of Binggeli & Hascher. The result shows that even the distribution of bricks in LEGO sets follow the universal mass function closely and confirms cosmic properties of mass on smaller scales.

The Gap in Healthcare

Rea Ghodasra

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Nova Southeastern University

Abstract

In Hans Rosling's *Factfulness*, he discusses "The Gap." In his opinion, there is no true gap in society, but rather misconceptions. People tend to fail to recognize overlaps when comparing averages. When two averages are separated, they seem to have a big disparity, but in most cases when combined, there is little to no gap. Rosling also delves into the "extremes" of society, the rich and the poor. In most cases, the extremes of society only account for a small percentage of the population. The majority of the population is an average of both extremes, middle-class. Lastly, Rosling discusses unintentional ignorance as viewed by the upper class, Level 4. Hans Rosling's theory of "The Gap" fits well into our society's misconceptions of the healthcare field. Nearly all aspects of healthcare, ranging from life expectancy rates to vaccination rates, have been steadily increasing over time in all regions of the world. For example, a survey was conducted asking major financial investors "How many of the world's 1-year-old children have been vaccinated against some disease?". The answer choices were 20%, 50%, and 80%. Results showed that an astonishing 85% of these investors guessed incorrectly. Today, 80% of 1-year-olds have been vaccinated against some disease. This paper shows some of the sources of bias regarding the level of information about healthcare in countries such as United States, Uganda, and Zimbabwe while comparing the actual levels in such countries to exemplify that the vast majority of the public has not been made aware of the advancements that the field of healthcare has experienced.

The Political Reintegration of Prominent Confederate Generals in the US During Reconstruction (1865-1877)

Steven Sigler

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Abstract

Confederate statues across the South selectively honor white supremacist generals at the exclusion of those Confederates who endorsed Reconstruction. Further blurring the history of postwar Confederate loyalties, historical literature has not adequately addressed Confederate generals according to their beliefs and actions during the Reconstruction Era. Through the examination of three case studies (Generals James Longstreet, Joseph Wheeler, and Wade Hampton III), this paper identifies three unique groupings of Confederate generals. Some had a change of heart defending freedmen as Republicans, others waited patiently to join Congress as a Democrat, and a vocal majority actively rejected national politics during Reconstruction. These categories suggest the variety among Confederate generals in political participation during Reconstruction. Statues should no longer uphold the outdated ideals of the Lost Cause at the expense of those generals who successfully reintegrated into US politics during Reconstruction.

Unraveling GSK-3: A Potential Target in Lung Cancer Cells

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Department of Biological Sciences
Halmos College of Natural Sciences and Oceanography

Faculty Sponsor: **Dr. Appu Rathinavelu**
Rumbaugh-Goodwin Institute for Cancer Research

Abstract

Lung cancer is the leading cause of cancer-related deaths among both men and women in the United States. Non-small cell lung cancer (NSCLC) is the most common form of lung cancer, accounting for 80-85% of all lung cancers. Although treatment options, such as chemotherapy, radiation therapy, or surgery, are being used to treat lung cancer patients, the 5-year survival rates in advanced stages of the cancer remains less than 15%. Therefore, there is an increasing need for new potential therapeutic targets and biomarkers in NSCLC cells. GSK-3, a regulatory protein kinase, functions to characterize many behaviors in cancer cells. GSK-3 modulates cellular responses such as cell proliferation, which can potentially depict the mitochondria's role in apoptosis and the role of caspase 3 and 7, reveal potential autophagy, as well as indicate reactive oxygen species (ROS)-mediated damage. This study aims to unravel the role of GSK-3 as potential targets facilitating apoptosis, leading to mitochondrial damage, especially in the wild type non-small cell lung cancer line, H1975, and the mutant non-small cell lung cancer line, H460. MTT Assay was performed with the GSK-3 inhibitor: BIO, over a period of 24 hours, 48 hours, and 72 hours. The results showed that as the concentrations of this GSK-3 inhibitor increased, the cell viability of both the H460 and the H1975 cells decreased significantly. The role of GSK-3 will be further investigated through western blot analysis and fluorescent microscopy. (This project was supported by The Royal Dames of Cancer Research Inc., Ft. Lauderdale, Florida).

Using *Caenorhabditis elegans* and an engineered bacterium to dissect host pathogen avoidance strategies.

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Abstract

Little is known about how host-pathogen interactions determine avoidance strategies. Bacterial pathogens can infect *Caenorhabditis elegans* via ingestion. In its natural environment, *C. elegans* is attracted to bacterial food sources that produce small molecules called chemoattractants. In some instances, chemoattractants are produced by bacterial pathogens. Upon ingesting these pathogens, *C. elegans* can become infected, and can subsequently perish. However, through aversive learning, *C. elegans* can learn to associate these chemoattractants with harm. This ultimately causes the worms to avoid consuming the pathogen. Evolutionary constraints have likely shaped the interplay of the attraction and learning dynamics between pathogenic bacteria and *C. elegans*. However, this remains largely unexplored. Using bacteria engineered to express an acylhomoserine lactone chemoattractant and a nematocidal protein, we explored how manipulating the amount of attractant produced by the bacteria affects learning and intoxication in *C. elegans*. We observed that the percentage of intoxicated worms is maximized when they are exposed to intermediate concentration of the chemoattractant. Towards explaining this observation, we measured the feeding rate of *C. elegans* fed on the engineered bacteria. We observed a significant reduction in feeding rate that apparently coincided with aversive learning. Our results aid our understanding of the dynamics that determine behavioral avoidance in *C. elegans*.

VEGF induced endothelial marker gene expression in Periodontal Ligament Derived Stem Cells (PDLSCs)

Shreya Patel

Biology

Halmos College of Natural Sciences and Oceanography

Faculty Sponsor: **Dr. Umadevi Kandalam**

Pediatric Dentistry

College of Dental Medicine

Abstract

Background: Establishing endothelial-cell mediated vascularization is crucial in bone tissue engineering, as blood vessels are key regulators for newly formed bone homeostasis and growth. Periodontal ligament stem cells (PDLSCs), derived from periodontal ligament tissue can differentiate into a wide range of cell types, including hepatocytes, osteoblasts, chondrocytes, and adipocytes. However, there is not much research focused on their ability to differentiate into endothelial cells. Objective: The objective of this study was to investigate the ability of PDLSCs differentiate into endothelial cells. Methodology: Human PDLSCs were harvested from impacted wisdom teeth from NSU clinics. The cells were cultured using standard protocols. Third or fourth passage cultures were used for all experiments. To induce endothelial differentiation, PDLSCs grown in complete medium (DMEM, 10% FBS, and 1% antibiotics) were treated with varied concentrations of VEGF, (10, 50, and 100 ng/ml). PDLSCs grown in complete medium alone were designated as the control. The expression of endothelial marker genes, vascular cell adhesion molecule (VCAM-1), kinase insert domain-containing receptor (KDR), and FMS related tyrosine kinase-1 (FLT-1) were measured using quantitative PCR. Results: Our results demonstrated the up regulation of all endothelial markers gene expression compared to cells grown in the absence of VEGF. Conclusion: PDLSCs have potential to differentiate into endothelial cells, thus supporting the formation of vascularized bone.

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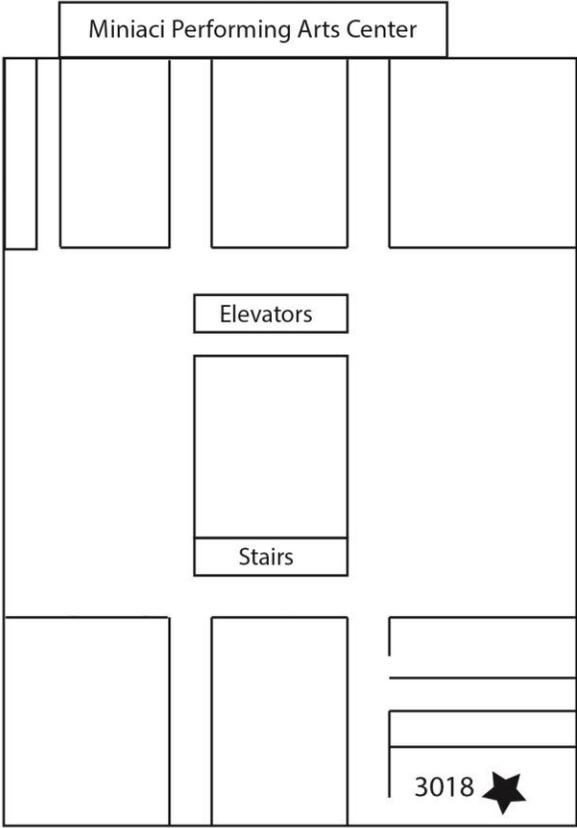
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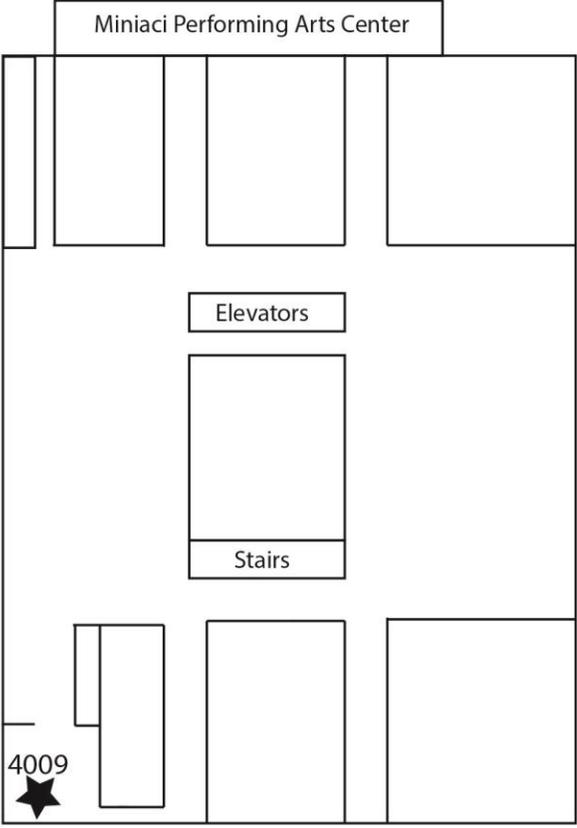
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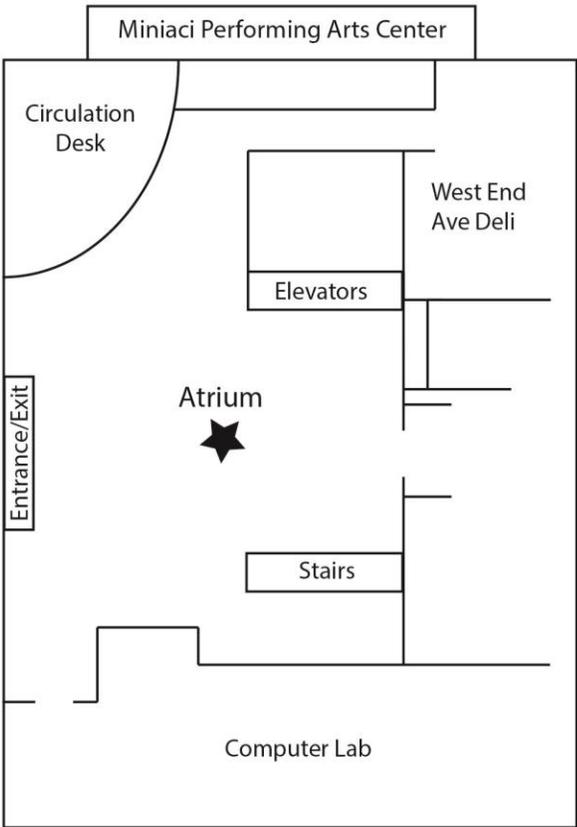
3rd Floor



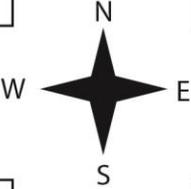
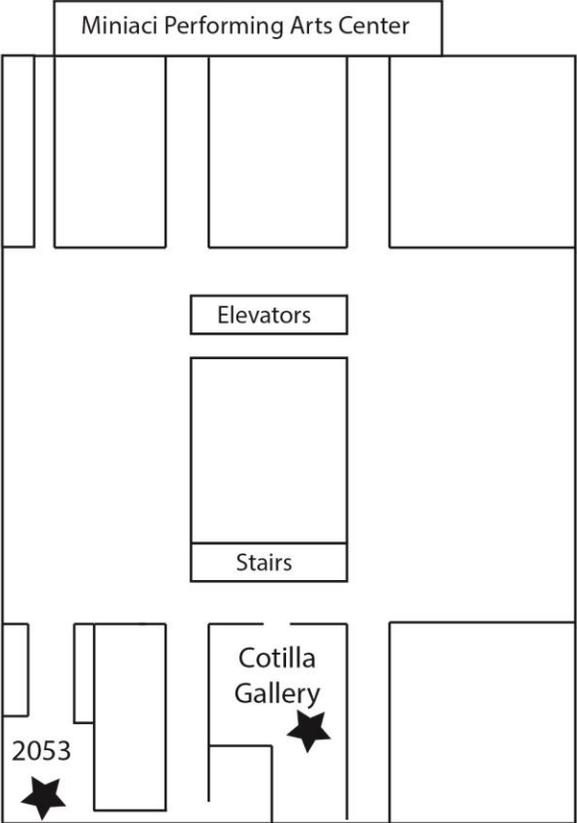
4th Floor



1st Floor



2nd Floor



UNDERGRADUATE STUDENT SYMPOSIUM
2019 Program Schedule

TIME	EVENT AND LOCATION		
1:00–1:45 p.m.	Welcome and Introduction Don Rosenblum, Ph.D. Dean, Farquhar Honors College Keynote Speaker Harry K. Moon, M.D. <div style="text-align: right;">Performance Theatre Don Taft University Center</div>		
1:45–3:15 p.m.*	Poster Presentations	First Floor Atrium	Alvin Sherman Library
1:45–4:00 p.m.*	Film Presentations	Cotilla Gallery	Alvin Sherman Library
2:45–4:00 p.m.*	Oral Presentations	Room 2053	Alvin Sherman Library
	Oral Presentations	Room 3018	Alvin Sherman Library
	Oral Presentations	Room 4009	Alvin Sherman Library
4:30–5:30 p.m.	Awards Ceremony	Performance Theatre	Don Taft University Center

*See separate detailed schedule for poster easel numbers, specific film showing times, and oral presentation room assignments.

Farquhar Honors College
 NOVA SOUTHEASTERN UNIVERSITY

